Aga Khan Health Services

Pakistan: The Aga Khan Health Service shaping the local market to provide environmentally-friendly air conditioners

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Within wider plans to reduce carbon emissions, the Aga Khan Health Service, Pakistan (AKHS, P) audited its equipment with the goal of improving energy efficiency.

Using carbon footprint data from its operations, refrigerant gases from older non-inverter driven air conditioners (ACs) were identified as one of the 'hotspots'. These AC units predominantly used R22 refrigerant gas, which has high global warming and ozone-depleting potential. Other units used R410a, which has a lower ozone depletion risk compared to R22, but nevertheless also represents significant global warming potential.

Corrective efforts began in 2020 with attempts by the procurement department to source environmentally-friendly R-32 systems from local vendors. Despite several attempts, vendors continued to propose R410a systems, indicating a gap in the availability of environmentally-friendly alternatives in the local market.

AKHS, P revamped its procurement process to prioritise energy-savings and environmental impact specifications within criteria for procurement as did other Aga Khan Development Network (AKDN) agencies within the country. This contributed to greater procurement power to leverage change and dialogue with local vendors to state requirements.

Subsequently, environmentally-friendly ACs started being produced in-country, bringing these new products into the local market. When AKHS, P began its research and dialogue with vendors, there was only one local vendor manufacturing R-32 air conditioners. Today, there are four local vendors producing R-32 ACs; imported ACs now also include models that use R-32.

In 2023, AKHS, P replaced 76% of its ACs which previously used R22 and 20% of ACs which used R410A, with newer, energy-efficient models that employ R32 refrigerant instead. R32 is more energy-efficient, has a lower global warming potential and is among the better options available in terms of impacts on ozone, too.

Through this initiative, carbon emissions from refrigerants will be cut through reduced energy usage (by more energy-efficient models) and better refrigerants. Replacing R22 with R32 saves about 61% of emissions per kilogram, whereas replacing R410A with R32 saves around 40%. We anticipate saving up to 30% in electricity bills compared with the older ACs. Most emissions saved will be due to reduced electricity use over the lifecycle of the new ACs.

Carbon emissions were calculated using the AKDN carbon management tool.

A comparison of refrigerants by global warming and ozone-depletion potential, as well as energy-efficiency.

Refrigerant	R32	R22	R410A
Global warming potential (GWP 100 yrs)	675	1,810	2,088
Ozone depletion potential	0	0.055	0
Energy efficiency	High	Low	Moderate

Source: Adopted from IPCC 5th Assessment report, 2014 [1]

A comparison of refrigerants emissions if 1 Kg of refrigerant gas was used.

Refrigerant	R32	R22	R410A
kg CO2e	677	1,760	1,130

Source: Calculated using DEFRA 2023 factors [2]

[1] : https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter08_FINAL.pdf
[2] : https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023